



Company: Anadarko

Site: Morton

Well: 23-1

Project: Weld County, Colorado (NAD83)

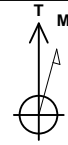
Rig Name: Xtreme 11



Planning: 936.442.2510 Fax: 936.442.2515
Operations: 936.442.2500 Fax: 936.442.2599

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
550.00	6.00	268.17	549.45	-0.50	-15.69	15.69	15.69	Hold 6.00° Inc
967.84	6.00	268.17	965.00	-1.90	-59.34	59.37	59.37	Begin 2.00°/100' Build
1567.75	18.00	268.17	1550.73	-5.87	-183.77	183.86	183.86	Begin 18.00° Tangent
5655.88	18.00	268.17	5438.82	-46.21	-1446.30	1447.04	1447.04	Begin 2.00°/100' Drop
6555.79	0.00	0.00	6324.00	-50.69	-1586.42	1587.23	1587.23	Begin Vertical Hold
8284.79	0.00	0.00	8053.00	-50.69	-1586.42	1587.23	1587.23	PBHL



Azimuths to True North
Magnetic North: 8.80°

Magnetic Field
Strength: 52913.1nT
Dip Angle: 66.76°
Date: 12/01/2011
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: Megan Pope
Date: 11:52, December 05 2011
Plan: Design #1

SURFACE LOCATION

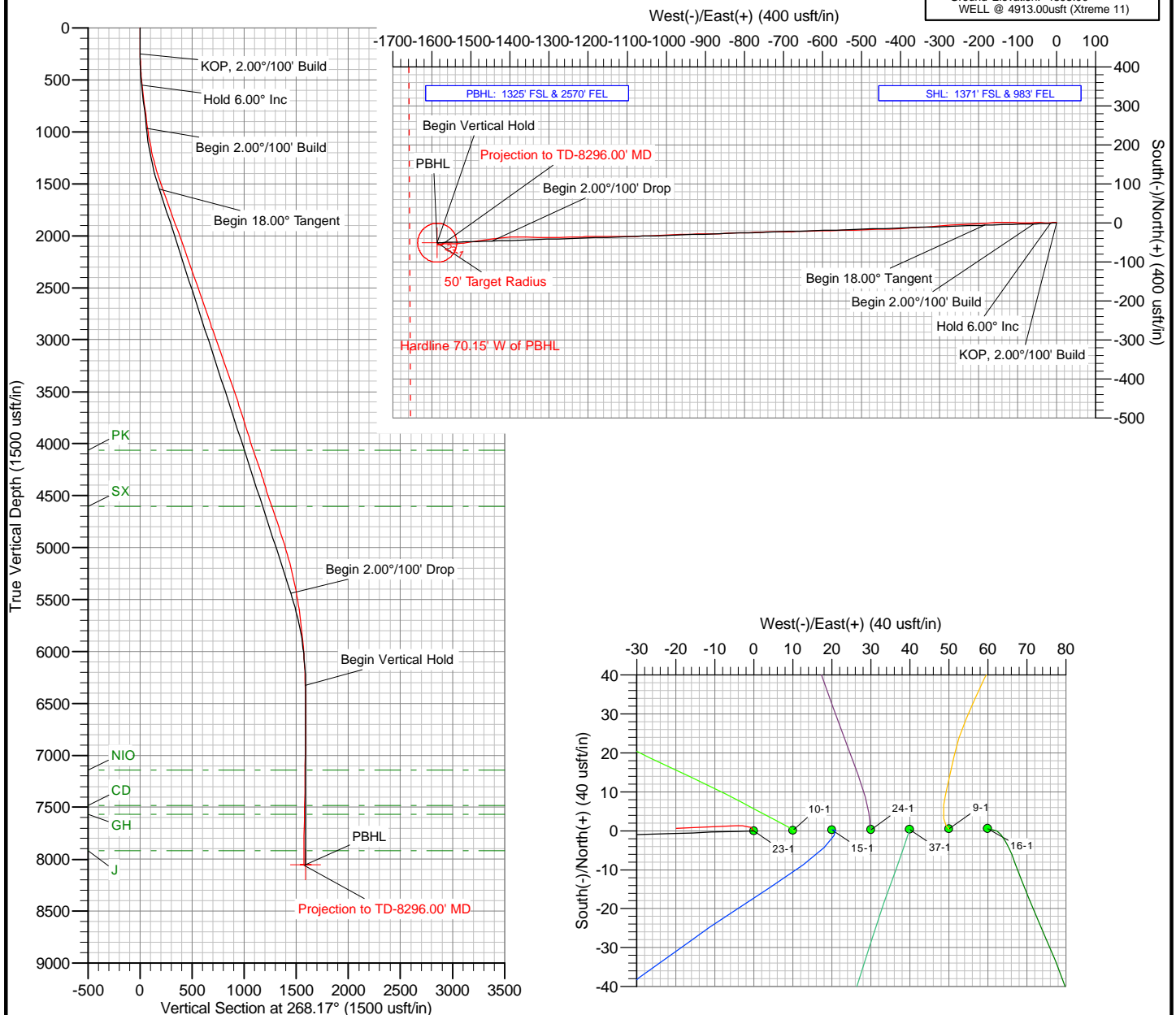
Northing: 1271418.33
Easting: 3186526.10
Latitude: 40° 4' 35.4335 N
Longitude: 104° 50' 0.407 W
Ground Elevation: 4898.00
WELL @ 4913.00usft (Xtreme 11)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
PBHL v1 - Morton 23-1	8053.00	-50.69	-1586.42	40° 4' 34.9320 N	104° 50' 20.816 W

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4063.00	4209.28	PK
4603.00	4777.06	SX
7143.00	7374.79	NIO
7483.00	7714.79	CD
7568.00	7799.79	GH
7918.00	8149.79	J



The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



Anadarko

Weld County, Colorado (NAD83)

Morton

23-1

Wellbore #1

Survey: MS MWD

Standard Survey Report

05 December, 2011

Company:	Anadarko	Local Co-ordinate Reference:	Well 23-1
Project:	Weld County, Colorado (NAD83)	TVD Reference:	WELL @ 4913.00usft (Xtreme 11)
Site:	Morton	MD Reference:	WELL @ 4913.00usft (Xtreme 11)
Well:	23-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

Project	Weld County, Colorado (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	23-1				
Well Position	+N/-S	0.00 usft	Northing:	1,271,418.33 usft	Latitude: 40° 4' 35.4335 N
	+E/-W	0.00 usft	Easting:	3,186,526.10 usft	Longitude: 104° 50' 0.407 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 4,898.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	12/01/11	8.80	66.76	52,913

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00		268.17

Survey Program	Date	12/05/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
103.00	8,296.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
103.00	0.10	346.50	103.00	0.09	-0.02	0.02	0.10	0.10	0.00	
192.00	0.60	327.70	192.00	0.56	-0.29	0.27	0.57	0.56	-21.12	
282.00	1.30	279.00	281.99	1.11	-1.55	1.51	1.12	0.78	-54.11	
372.00	2.60	272.30	371.93	1.36	-4.60	4.55	1.46	1.44	-7.44	
463.00	5.20	264.90	462.71	1.07	-10.77	10.73	2.90	2.86	-8.13	
554.00	6.20	269.50	553.26	0.66	-19.79	19.76	1.21	1.10	5.05	
644.00	6.90	270.50	642.68	0.67	-30.05	30.02	0.79	0.78	1.11	
735.00	7.20	271.80	732.99	0.89	-41.22	41.17	0.37	0.33	1.43	
826.00	7.60	269.30	823.23	1.00	-52.94	52.88	0.56	0.44	-2.75	
927.00	7.50	268.80	923.35	0.78	-66.21	66.15	0.12	-0.10	-0.50	
1,017.00	7.70	266.30	1,012.56	0.27	-78.10	78.05	0.43	0.22	-2.78	
1,108.00	11.00	273.20	1,102.35	0.36	-92.85	92.79	3.82	3.63	7.58	
1,199.00	12.60	272.80	1,191.42	1.33	-111.44	111.34	1.76	1.76	-0.44	
1,290.00	14.20	269.80	1,279.94	1.78	-132.51	132.39	1.92	1.76	-3.30	

Company:	Anadarko	Local Co-ordinate Reference:	Well 23-1
Project:	Weld County, Colorado (NAD83)	TVD Reference:	WELL @ 4913.00usft (Xtreme 11)
Site:	Morton	MD Reference:	WELL @ 4913.00usft (Xtreme 11)
Well:	23-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,381.00	16.70	266.90	1,367.65	1.03	-156.73	156.62	2.87	2.75	-3.19	
1,471.00	18.40	267.00	1,453.45	-0.41	-183.83	183.75	1.89	1.89	0.11	
1,562.00	18.00	266.90	1,539.90	-1.93	-212.21	212.17	0.44	-0.44	-0.11	
1,653.00	19.70	266.00	1,626.02	-3.76	-241.56	241.55	1.90	1.87	-0.99	
1,744.00	20.10	266.00	1,711.58	-5.92	-272.46	272.51	0.44	0.44	0.00	
1,835.00	20.80	265.50	1,796.85	-8.28	-304.16	304.27	0.79	0.77	-0.55	
1,925.00	20.20	267.00	1,881.15	-10.34	-335.61	335.77	0.89	-0.67	1.67	
2,016.00	20.50	265.60	1,966.47	-12.39	-367.19	367.40	0.63	0.33	-1.54	
2,107.00	19.30	266.90	2,052.03	-14.42	-398.09	398.35	1.41	-1.32	1.43	
2,198.00	19.30	267.70	2,137.92	-15.84	-428.14	428.42	0.29	0.00	0.88	
2,289.00	19.30	270.20	2,223.81	-16.39	-458.20	458.49	0.91	0.00	2.75	
2,379.00	19.20	267.90	2,308.78	-16.88	-487.86	488.15	0.85	-0.11	-2.56	
2,470.00	19.20	267.60	2,394.72	-18.06	-517.77	518.08	0.11	0.00	-0.33	
2,560.00	20.60	268.60	2,479.34	-19.06	-548.38	548.71	1.60	1.56	1.11	
2,651.00	20.00	270.20	2,564.69	-19.40	-579.95	580.27	0.90	-0.66	1.76	
2,742.00	18.70	267.70	2,650.55	-19.93	-610.09	610.41	1.69	-1.43	-2.75	
2,833.00	17.90	269.50	2,736.94	-20.64	-638.65	638.98	1.08	-0.88	1.98	
2,924.00	18.10	266.00	2,823.49	-21.75	-666.74	667.09	1.21	0.22	-3.85	
3,014.00	19.40	271.40	2,908.72	-22.36	-695.63	695.99	2.41	1.44	6.00	
3,105.00	19.70	268.80	2,994.48	-22.31	-726.07	726.42	1.01	0.33	-2.86	
3,196.00	20.80	266.90	3,079.85	-23.50	-757.54	757.91	1.41	1.21	-2.09	
3,287.00	19.50	269.30	3,165.28	-24.56	-788.87	789.25	1.69	-1.43	2.64	
3,378.00	19.10	267.70	3,251.17	-25.35	-818.93	819.32	0.73	-0.44	-1.76	
3,468.00	19.30	266.90	3,336.16	-26.74	-848.49	848.91	0.37	0.22	-0.89	
3,559.00	18.60	270.20	3,422.23	-27.50	-878.02	878.45	1.41	-0.77	3.63	
3,650.00	18.10	269.70	3,508.60	-27.53	-906.67	907.09	0.58	-0.55	-0.55	
3,741.00	18.60	266.00	3,594.98	-28.61	-935.29	935.72	1.39	0.55	-4.07	
3,831.00	17.50	269.00	3,680.55	-29.85	-963.14	963.60	1.60	-1.22	3.33	
3,922.00	17.90	267.70	3,767.24	-30.65	-990.79	991.26	0.62	0.44	-1.43	
4,013.00	18.50	267.40	3,853.69	-31.87	-1,019.19	1,019.68	0.67	0.66	-0.33	
4,104.00	16.90	267.20	3,940.38	-33.17	-1,046.82	1,047.35	1.76	-1.76	-0.22	
4,195.00	18.20	269.00	4,027.14	-34.06	-1,074.24	1,074.78	1.55	1.43	1.98	
4,285.00	18.60	270.40	4,112.54	-34.21	-1,102.65	1,103.18	0.66	0.44	1.56	
4,376.00	18.60	267.70	4,198.79	-34.69	-1,131.66	1,132.19	0.95	0.00	-2.97	
4,467.00	18.80	270.90	4,284.99	-35.04	-1,160.83	1,161.35	1.15	0.22	3.52	
4,558.00	16.30	270.20	4,371.75	-34.77	-1,188.26	1,188.77	2.76	-2.75	-0.77	
4,649.00	18.40	267.20	4,458.60	-35.42	-1,215.38	1,215.89	2.51	2.31	-3.30	
4,739.00	18.80	269.70	4,543.90	-36.19	-1,244.07	1,244.59	0.99	0.44	2.78	
4,830.00	18.80	268.10	4,630.05	-36.76	-1,273.39	1,273.91	0.57	0.00	-1.76	
4,921.00	18.60	269.30	4,716.25	-37.42	-1,302.55	1,303.09	0.48	-0.22	1.32	
5,012.00	16.90	272.80	4,802.91	-36.95	-1,330.28	1,330.78	2.20	-1.87	3.85	
5,103.00	17.90	271.60	4,889.75	-35.91	-1,357.47	1,357.93	1.17	1.10	-1.32	
5,194.00	17.50	268.60	4,976.44	-35.86	-1,385.13	1,385.57	1.09	-0.44	-3.30	
5,284.00	16.30	266.00	5,062.56	-37.07	-1,411.26	1,411.72	1.58	-1.33	-2.89	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,375.00	14.90	263.70	5,150.20	-39.24	-1,435.63	1,436.15	1.68	-1.54	-2.53	
5,466.00	13.50	261.80	5,238.42	-42.04	-1,457.77	1,458.37	1.62	-1.54	-2.09	
5,557.00	12.00	258.90	5,327.17	-45.38	-1,477.57	1,478.26	1.79	-1.65	-3.19	
5,647.00	11.20	263.00	5,415.34	-48.25	-1,495.42	1,496.20	1.28	-0.89	4.56	
5,738.00	9.60	261.40	5,504.84	-50.46	-1,511.70	1,512.54	1.79	-1.76	-1.76	
5,829.00	7.90	264.40	5,594.78	-52.20	-1,525.43	1,526.32	1.93	-1.87	3.30	
5,920.00	7.70	270.00	5,684.94	-52.81	-1,537.75	1,538.65	0.86	-0.22	6.15	
6,010.00	6.70	270.40	5,774.23	-52.78	-1,549.03	1,549.92	1.11	-1.11	0.44	
6,101.00	5.70	267.40	5,864.69	-52.94	-1,558.85	1,559.75	1.15	-1.10	-3.30	
6,192.00	4.70	267.40	5,955.32	-53.32	-1,567.09	1,567.99	1.10	-1.10	0.00	
6,283.00	3.90	264.40	6,046.06	-53.79	-1,573.89	1,574.81	0.91	-0.88	-3.30	
6,374.00	3.20	261.60	6,136.88	-54.46	-1,579.49	1,580.42	0.79	-0.77	-3.08	
6,510.00	0.70	292.70	6,272.80	-54.70	-1,584.01	1,584.95	1.93	-1.84	22.87	
6,646.00	0.40	262.30	6,408.79	-54.44	-1,585.25	1,586.18	0.30	-0.22	-22.35	
6,782.00	0.40	289.00	6,544.79	-54.35	-1,586.17	1,587.09	0.14	0.00	19.63	
6,918.00	0.40	141.00	6,680.79	-54.56	-1,586.32	1,587.25	0.57	0.00	-108.82	
7,055.00	0.60	140.10	6,817.78	-55.48	-1,585.55	1,586.52	0.15	0.15	-0.66	
7,191.00	0.30	104.80	6,953.78	-56.12	-1,584.75	1,585.74	0.29	-0.22	-25.96	
7,327.00	0.50	101.30	7,089.77	-56.33	-1,583.83	1,584.82	0.15	0.15	-2.57	
7,463.00	0.70	77.70	7,225.77	-56.27	-1,582.43	1,583.42	0.23	0.15	-17.35	
7,599.00	1.00	92.50	7,361.75	-56.14	-1,580.44	1,581.42	0.27	0.22	10.88	
7,735.00	0.90	110.40	7,497.73	-56.57	-1,578.25	1,579.25	0.23	-0.07	13.16	
7,872.00	1.10	95.60	7,634.71	-57.07	-1,575.93	1,576.95	0.24	0.15	-10.80	
8,008.00	1.10	46.80	7,770.69	-56.30	-1,573.68	1,574.68	0.67	0.00	-35.88	
8,144.00	1.20	40.60	7,906.66	-54.33	-1,571.80	1,572.74	0.12	0.07	-4.56	
8,251.00	1.50	28.80	8,013.63	-52.25	-1,570.40	1,571.27	0.38	0.28	-11.03	
8,296.00	1.50	28.80	8,058.62	-51.22	-1,569.83	1,570.67	0.00	0.00	0.00	
Projection to TD-8296.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
8,296.00	8,058.62	-51.22	-1,569.83	Projection to TD-8296.00' MD	